291092

JPRS 81707

3 September 1982

China Report

SCIENCE AND TECHNOLOGY

No. 173

19981203 144

DTIC QUALITY INSPECTED 8

FBIS FOREIGN BROADCAST INFORMATION SERVICE

8
38
AØ3

NOTE

JPRS publications contain information primarily from foreign
newspapers, periodicals and books, but also from news agency
transmissions and broadcasts. Materials from foreign-language
sources are translated; those from English-language sources
are transcribed or reprinted, with the original phrasing and
other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets
[] are supplied by JPRS. Processing indicators such as [Text]
or [Excerpt] in the first line of each item, or following the
last line of a brief, indicate how the original information was
processed. Where no processing indicator is given, the infor-
mation was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are
enclosed in parentheses. Words or names preceded by a ques-
tion mark and enclosed in parentheses were not clear in the
original but have been supplied as appropriate in context.
Other unattributed parenthetical notes within the body of an
item originate with the source. Times within items are as
given by source.

The contents of this publication in no way represent the poli-
cies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical
Information Service, Springfield, Virginia 22161. In order-
ing, it is recommended that the JPRS number, title, date and
author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports
Announcements issued semi-monthly by the National Technical
Information Service, and are listed in the Monthly Catalog of
U.S. Government Publications issued by the Superintendent of
Documents, U.S. Government Printing Office, Washington, D.C.
20402.

Correspondence pertaining to matters other than procurement
may be addressed to Joint Publications Research Service,
1000 North Glebe Road, Arlington, Virginia 22201.

CHINA REPORT

SCIENCE AND TECHNOLOGY

No. 173

CONTENTS

PEOPLES' REPUBLIC OF CHINA

ABSTRACTS

CHINESE-MADE 'Y-7' FLIGHT TESTS SAID SUCCESSFUL

Turboprop Transport May Fill Many Roles

[Article by Li Yuanwen (2621 0337 2429) and Chi Wenjun (6688 2429 3182)]

[Text] Designed to meet the needs of transportation along feeder routes in this country, the Chinese-made "Y-7" is a medium range twin-engine turboprop airplane with a passenger capacity of 48-52 people. If necessary, it can be modified into a cargo plane or a combination passenger-cargo airplane. It can also be used to perform such missions as resource exploration, mapping, aerial delivery, and rescue.

The "Y-7" has two WJ5A-1 turboprop engines, each with an equivalent power of 2,900 hp, which is sufficient for take-off under high altitude and high temperature conditions. It is well suited to operate under the wide range of terrain, geographic, and weather conditions of China's vast territory, and therefore can satisfy the needs of transportation along the feeder routes of this country. The "Y-7" has been flight tested in typical high-altitude airports such as Kunming, Lanzhou, Xining, Guelmo; and in airports with high summer temperatures such as Shanghai, Canton, Nanking, Wuhan, Chungking; as well as in airports with unpaved runways such as Hanzhong, Xianyang, and Shanyuan. The "Y-7" has accumulated over 1,600 flight hours and over 3,600 take-offs and landings. In early April, flight tests were conducted at the Tianjin Commercial Airport, which included: 19.2-ton and 21-ton single-engine take-off tests, and 21-ton single-engine take-off abort tests.

The maximum range of the airplane is 1,900 km; if the plane is carrying 48 passengers with a 45-minute fuel reserve and a take-off weight of 21 tons, the range would be 1,000 km.

Because of the large take-off power of the engine, the sea-level climb rate can be as high as 8.5 m/sec. When the take-off weight is 21 tons with both engines at rated power, the ceiling is 8,750 m. With a take-off weight of 21 tons and engines operating at 85 percent of their rated power, the cruising speed is 480 km/hr. According to specifications, if the airplane took off from an airport at sea level under 40° C temperature, or from an airport 2,000 m above sea level under 20° C temperature, and shut off one engine after

reaching a safe altitude, the maximum take-off weight is limited to 21.8 tons under the condition of 2.5 percent second-stage climb. With a take-off weight of 21 tons under standard atmospheric conditions, the take-off distance is 580 m, and the landing distance is 575 m. With a take-off weight of 20 tons, the ceiling for single engine operation is 3,400 m.

The important technical data of the "Y-7" are as follows:

length	23.708 m
width	2.9 m
wing span	29.25 m
height	8.56 m
main wheel base	7.9 m
front wheel base	7.9 m
wing area	75 m^2
maximum take-off weight	21,000–22,000 kg
maximum landing weight	21,000–22,000 kg
empty weight	14,235 kg
maximum fuel capacity	4,000 kg (without auxiliary fuel tank)
	4,800 kg (with auxiliary fuel tank)
maximum payload	4,700 kg

The fuselage of the "Y-7" has a semi-rigid structure; its cross-section consists of two circular arcs with different diameters. The fuselage has three sections; the front and midsections are sealed cabins. The front section contains the cockpit and a 4.5 m^3 forward luggage compartment. The cockpit can accommodate 5 crew members: pilot, co-pilot, navigator, radio operator, and engineer. The midsection contains the passenger cabin, the service cabin, and a 7 m^3 rear luggage compartment. The passenger cabin has a volume 10m x 2.76m x 1.86m. The basic model can accommodate 48 passengers and 1 service person, with 780 mm clearance between rows; the economy-class model can accommodate 52 passengers and 1 attendant, with 720 mm clearance between rows. The 0.75m x 1.4m passenger door is located at the left side of the fuselage; the 1m x 1.2m cargo door is located at the forward right side; and the 0.51m x 0.60m emergency door is located at the right side.

The wing is composed of a rectangular central section, and trapezoidal mid- and outer sections. The wing cross-section is a laminar-flow airfoil with double convex profile. The wing design has a geometric twist as well as aerodynamic twist to improve flight characteristics during loss of speed. The central wing section contains a soft fuel tank, which is joined below with the engine and the main landing gear. The midwing section is an integral fuel tank. The central wing section has a single-split flap, the mid wing section has a double-split flap, and the outer wing section has two segmented ailerons. The leading edge of the wing is equipped with a heating device for ice prevention.

The cantilevered tail structure is all metal; the horizontal tail has an upward tilt angle to minimize the adverse effects from wing turbulence, but it still remains in the smooth slipstream generated by the propeller. The large

fins above and below the fuselage provide improved lateral stability. The landing gear is of the forward three-point type, each with two wheels hydraulically operated. The front wheels are used for turning, and the main wheels are equipped with disc brakes. The landing gear is retractable in the forward direction to ensure emergency release under the action of head-winds and gravity. The main landing gear is equipped with low-pressure tires so that the airplane can take off and land safely on an unpaved runway.

The turbine blades of the WJ5A-1 turboprop engine are designed using advanced hollow air cooling technology, so that the engine power can be increased by raising the temperature of gas entering the turbine. The engine is also equipped with a speed conversion device which provides two speeds of rotation I and II. During take-off at speed II, the engine can generate power as high as 2,900 hp. The engines are located high above the ground to avoid debris from entering the inlets. The four-blade J16-G10A propeller has the capabil-ity to automatically vary the pitch and align the blades, and sufficient clearance is provided between the blades and the ground. In addition, there is a turbo-generator which can be used to start the engines in case no ground electric sources are available.

Two independent fuel systems can supply fuel to each of the two engines; the two systems are connected with a valve. The central wing section can accom-modate four or eight soft fuel tanks, depending on customer requirement.

The hydraulic system consists of a main system and an emergency system. The main system is used to operate the flaps, [main] landing gear, front wheels, brakes, emergency propeller alignment, and emergency engine cut-off; the emergency system is used for emergency main wheel braking, and emergency operation of the flaps.

The elevator control surfaces are operated by steel cables; and the rudder and ailerons are operated by electric motors. The autopilot is connected to the control system, and can be activated by the pilot to operate the plane if the need arises.

The high altitude system performs the functions of automatic adjustment of air temperature and pressure to maintain proper cabin temperature and pres-sure, and to ensure an adequate supply of fresh air in the cabins. The air supply in the cabins is provided by the compressed air from the 10th stage of the compressor; it ensures that the cabin air is replaced 20-26 times every hour. The cabins are also equipped with two portable oxygen tanks for emergency use by the crew members and passengers.

The ice prevention system uses both hot air and electric heating. The wing and tail, the air inlet section of the engine, and the deflectors in the air intake are heated by hot air from the compressor; the propellers and the windshield are heated by electricity to prevent ice formation.

The electrical system includes a 27-volt d.c. supply, a 115-volt, 400-Hertz single-phase a.c. supply, and a 36-volt, 400-Hertz three-phase a.c. supply.

The main d.c. supply consists of two starting generators and two batteries as an emergency power source; the main a.c. supply consists of two generators, a single-phase alternator, and 4 three-phase alternators.

The navigation instruments include: gyroscopic half compass, gyro induction compass, magnetic compass, horizon sensor, autopilot, altimeter, speedometer, climb and descent rate meter, turn indicator, pitch indicator and clock; the radio navigation equipment include: radar, radio compass, radio altimeter, and receiver; the communication equipment include: short-wave and ultra short-wave transceivers, and intercom.

In order to reduce weight and to improve fatigue characteristics, extensive integral structures are used. For example, the main spar, plates, and ribs of the wing, joints between the engine and the wing, as well as joints between the fuselage and wing are all integral structures. The fuselage skin is attached to the long purlin using adhesive welding techniques.

During the development process of the "Y-7," various tests were conducted on the whole airplane as well as on individual components. They include: force and pressure measurements in the wind tunnel, static load test, ground resonance test, impact test of the landing gear, system test, design certification flight test, system and onboard equipment reliability test, etc. Fatigue tests of the whole airplane are currently underway; at present, fatigue test of the fuselage has exceeded 48,000 flight hours; the plan is to continue the test for a total of 120,000 hours.

On the basis of the ground and flight test results, it has been specified that major overalls for the "Y-7" will be every 5 years or 5,000 flight hours.
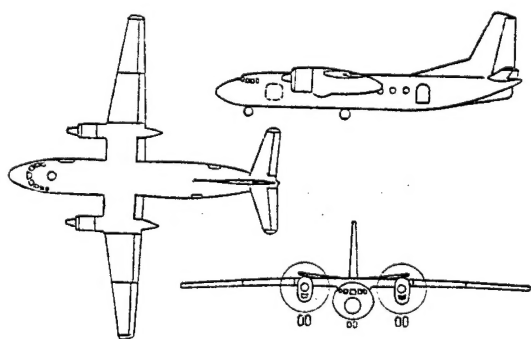

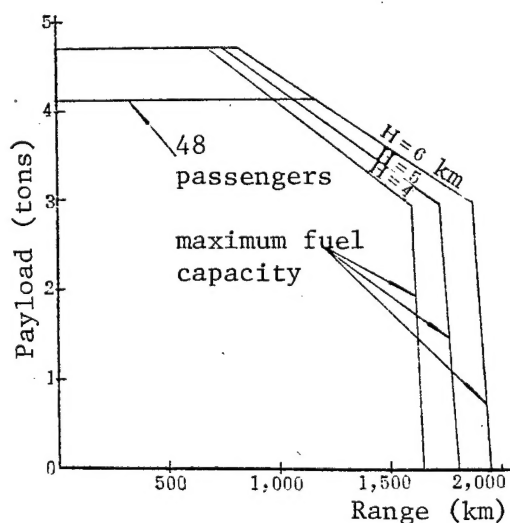Figure 1. Three Views of "Y-7"

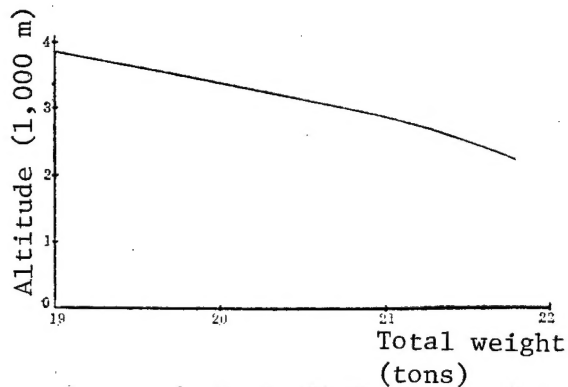Figure 2. Payload-Range Diagram of "Y-7"

Figure 3. Single-Engine Ceiling of "Y-7"
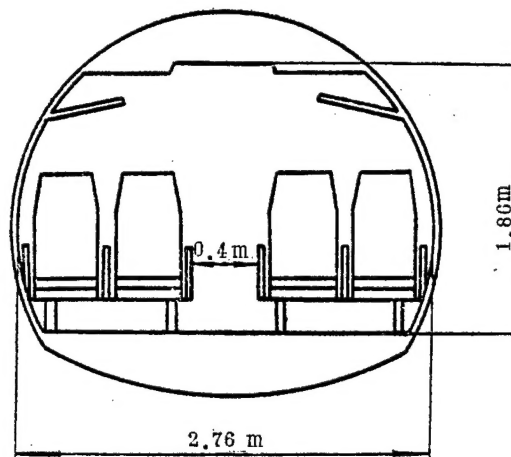
Figure 4. Seating Arrangement in Basic Model of "Y-7"
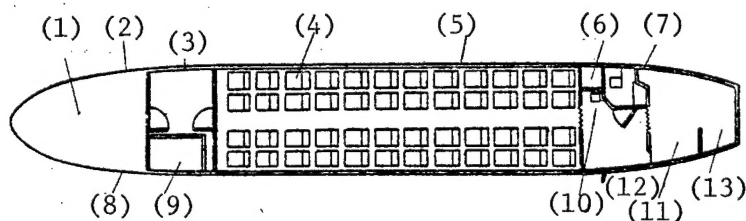
Figure 5. Internal Layout of "Y-7"

Key:

1. Front cockpit (left and right pilot seat)
2. Radio operator window
3. Cargo door
4. Passenger seats
5. Emergency exit
6. Food storage room
7. Luggage compartment door
8. Navigator window
9. Luggage compartment
10. Seat for service person
11. Coat and hat compartment
12. Passenger cabin door
13. Rear luggage compartment

Single-Engine Take-Off Tests Passed

[Text] On the morning of 4 April 1982, we arrived at the Tianjin Zhang-gui-zhuang Commercial Airport. The Chinese made "Y-7" transport airplane was undergoing single-engine take-off tests at this airport.

The "Y-7" was designed to provide air transportation along side routes in this country. It can operate over China's vast territory under a wide range of weather conditions; and it can take off and land at most airports. The airplane can carry 48-52 passengers, or it can be modified into a cargo plane or combination passenger-cargo plane. Since its completion, the "Y-7" has visited airports located in 28 provinces, cities, and autonomous regions, except Xizhang region and Taiwan Province.

If one of the two engines fails during take-off, the pilot must be able to control the airplane and either continue taking off with a single engine or abort the take-off to ensure passenger safety. Consequently, the single-engine take-off test is one of the key tests for the "Y-7."

On the airfield, the ground crews are busy inspecting each system of the airplane over and over again. The spectators began entering the airfield in small groups, and gathered around a designated area. On this eve before "Y-7" goes into service, they could not contain their excitement. Some comrades were so confident in our scientists, engineers, and technicians that they had little doubt about the success of this test; others seemed a bit worried because they were concerned about the technical complexity of the test and our lack of experience.

At 5:25, members of the flight test team in civil aviation uniforms and the technicians began boarding the plane. With complete confidence in the performance of the "Y-7" and the success of this flight test, they smiled and waved at crew members on the ground. The two engines were started one after another, and the "Y-7" began rolling toward the runway.

At about 6:00, the commander issued a take-off signal. The "Y-7" with a take-off weight of 19.2 tons began accelerating on the runway. At this time, everyone on the airfield is holding his breath, but not the members of the flight test team. They were not only an experienced flight team but also had the common goal to develop China's aviation industry. Recently, they underwent intensive simulated flight training at various airports around the country; they acquired a thorough understanding of the airplane's performance as well as highly proficient operating skills. But this particular flight test is considered one of the most dangerous and most complex flight tests, and its success or failure would be determined in a split second. Thus, it is only reasonable that everyone is feeling the anxiety before the crucial event takes place.

Suddenly, the airplane has reached the critical speed. With the airplane 2.5 m above the ground, the right engine (key engine) was shut off, and the propellers began to slow down, and finally stopped. The left engine however continued to roar. After a slight disturbance, the airplane continued along its flight course, and climbed steadily upward; the landing gear was quickly retracted. Having reached an altitude of approximately 400 m and completed its take-off flight maneuvers above the airfield, the "Y-7" headed toward the runway and with a single engine gradually touched down. The pilot executed the maneuvers precisely and cleanly. The data measured from this test were better than expected; this single-engine take-off test was a complete

success! All the spectators rushed toward the airfield and expressed their congratulations to the members of the flight team and the technical team as well as the ground crew.

After a short rest, at 7:30, the same flight test was repeated with the take-off weight increased to 21 tons. For a medium size airplane, an increase of 1,800 kg in payload is a severe test for both the airplane as well as the flight team and technicians. But armed with their 19.2-ton experience and careful attitude, the second flight test was also successfully completed. As they happily stepped out of the airplane, the joy of success touched everyone on the airfield.

On 7 April, the "Y-7" underwent another flight test where take-off was aborted with a single engine. Compared with the previous test this event is much easier. But the flight crew maintained their serious attitude as usual, and the technicians were faithfully checking all the data. They firmly believe that the only way to ensure success is to maintain a serious scientific attitude. Under maximum take-off weight, the airplane successfully completed a sequence of operations: accelerating on the runway, lifting the front wheels, shutting off the right engine, automatically aligning the propellers, and applying normal braking before touch down. The result of the test was outstanding: the lateral displacement was only 4 m.

At this point, the flight test events of the "Y-7" were concluded.

With one engine shut off, the symmetry of forces acting on the airplane is destroyed. The airplane will suddenly tilt toward one side due to the thrust and moment of the operating engine, and the drag and moment of the idling engine. Furthermore, the lift coefficient will decrease and the drag coefficient will increase, resulting in smaller lift to drag ratio. This makes the control of the airplane more complicated and also places higher demands on the reliability, structural strength, and performance of the flight system. Therefore, the single-engine flight test was a severe test for all parts of the airplane.

The success of this flight test provided valuable reference data for future airplane design and certification; it also revealed a bright future for developing China's independent aviation industry.

In an interview with the members of the flight team, they all said, "We are really attached to this domestically produced passenger plane." The success of this test was a result of the joint efforts of technical personnel, laborers, and Party officers; it also depended on the unconditional support from all the departments concerned. Having passed this flight test, it will not be long before the "Y-7" is put into regular service.
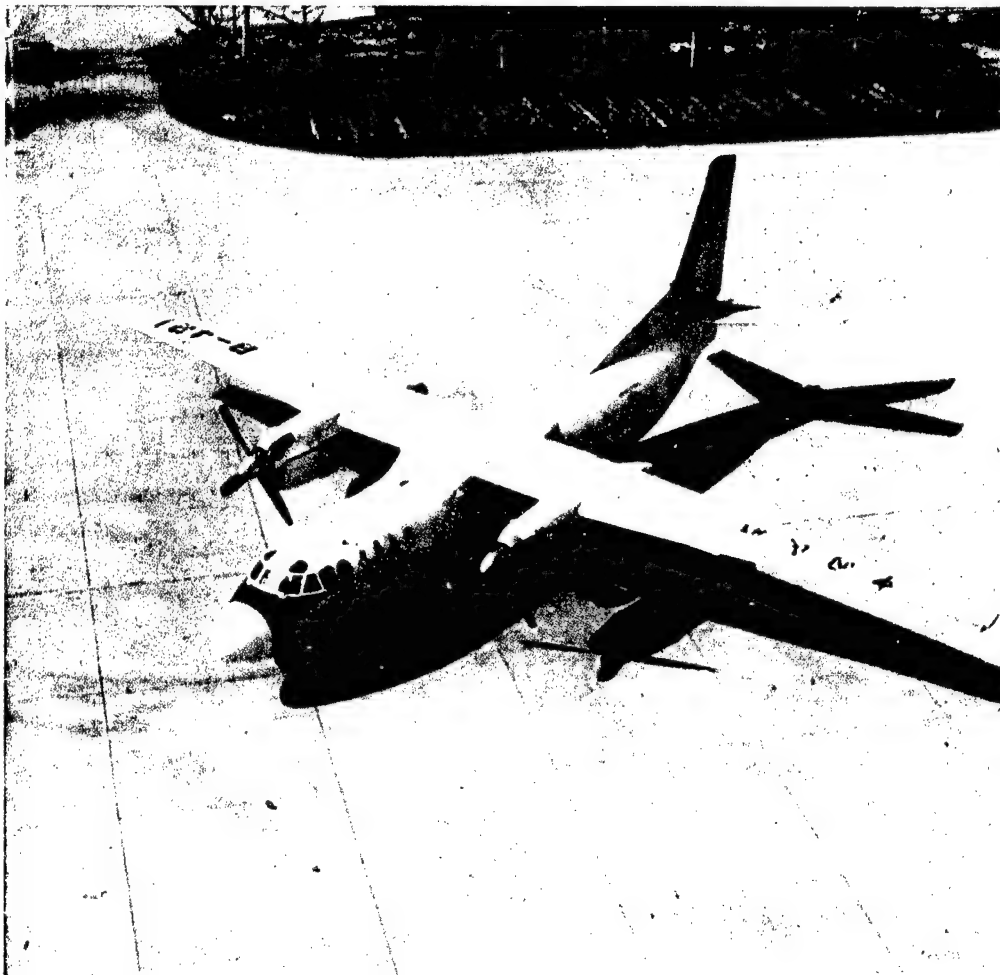
"Y-7" during single-engine take-off tests.

3012
CSO: 4008/209

8

APPLIED SCIENCES

APPLICATION OF REMOTE SENSING TECHNOLOGY APPLIED TO FORESTRY

Guangzhou GUANGZHOU RIBAO in Chinese, 12 Jun 82 p 2

[Article by Zhang Tingchun [1728 1694 2504]]

[Text] On 26 May, Shen Pengfei, a famous 90-year-old forestry expert, and
Professor Xu Yanqian climbed Nankun Mountain to set up a new experiment and
research project at the South China Forest remote sensing experiment station
located on Nankun Mountain.

The application of advanced remote sensing technology to modernized forestry
is expected to accomplish what had not been possible until now in the field
of tapping forest resources, monitoring changes and disasters, and resource
management. Professor Shen Pengfei and the teachers of the South China
Forestry Management Research Laboratory who selected the Nankun Mountain
in 1980 as the site for the first south China forestry remote sensing experi-
ment station had been working with the Ministry of Forestry and forest work-
ers of the province on various experiments and research projects. With the
aid of aerial photography and multispectral photography and surveying, they
have prepared a set of representative photos of the forests of south China,
and launched nine research projects covering the vegetation, forest com-
munities and their development, the forest soil, and the natural renewal of
the rare broad leaf species of Nankun Mountain. They also applied the remote
sensing technology to cover the classification and successions of forests in
south China, and studied the major forest types and the spectral characteris-
tics of the principal species of trees on Nankun Mountain. The whole experi-
ment station took nearly 2 years to complete. · Now Professor Shen Pengfei
and his associates have gone up the mountain again to prepare for new re-
search projects, including multispectral and large-scale remote sensing
flights scheduled to take place in the coming fall. The Ministry of Forestry
·will also dispatch its technical crew to conduct extensive surveys.

5360
CSO: 5000/4054

APPLIED SCIENCES

BRIEFS

LIBRARY ARCHITECTURE SOCIETY--The National Library Architecture and Design
Society held a meeting in Xi'an on 18 March 1982. The library director at
our institute, Liu Dehuan, presented a paper "Discussions on problems of
designing a library for institutions of higher learning." The architectural
plans of the new library of our institute were displayed at the meeting.
[Text] [Shenyang DONGBEI GONGXUEYUAN XUEBAO [JOURNAL OF NORTHEAST INSTITUTE
OF TECHNOLOGY] in Chinese No 2, 1982 p 118] 9899

ROTATING FURNACE SOCIETY--The National Rotating Furnace Society for Steel
Production held a meeting in Liuchow 6-13 March 1982. From the Steel
Smelting Department of our institute, Assistant Professors Xu WenPai
[1776 2429 3175], Feng Chunrong [7458 2504 2807] and instructor Jiang ShiCai
[6199 1597 5591] attended the conference and presented two papers: "Studies
on the penetration lengths of side-blown oxygen streams into the melting
troughs of steel furnaces" and "Directions and procedures for energy saving
in rotating furnaces for steel production." They also exchanged three
papers. These papers have been put into the collected papers of the Chinese
Metallurgical Society. [Text] [Shenyang DONGBEI GONGXUEYUAN XUEBAO [JOURNAL
OF NORTHEAST INSTITUTE OF TECHNOLOGY] in Chinese No 2, 1982 p 118] 9899

GEAR TECHNOLOGY IN METALLURGICAL MINES--From 27 March to 1 April 1982, a
meeting was held in Suzhou on gear technology in metallurgical mines. From
the Mechanical Engineering Department of our institute, Assistant Professors
Hu Maoxian and Cai Chunyuan and instructor Gao Shiyuan attended the conference
and presented two reports: "Studies on steel gears" and "Studies on improving
the life and load capacity of axial gears in steel-forging machinery." [Text]
[Shenyang DONGBEI GONGXUEYUAN XUEBAO [JOURNAL OF NORTHEAST INSTITUTE OF
TECHNOLOGY] in Chinese No 2, 1982 p 118] 9899

METALLURGICAL MECHANICS, STEEL SMELTING--A conference on metallurgical
mechanics and steel-smelting theories was held at Chongqing University 12-16
April 1982. From the Steel Metallurgy Department of our institute,
Professor Ren Shizheng and Assistant Professor Xiao Zeqiang, and from the
Colorimetry Department, Professor Liang Ningyuan and Assistant Professor
Shen Shiying attended the conference and presented three papers: "Momentum
Transport in Metallurgical Processes," "Current status of research on the
fundamental theories of jet metallurgy," and "Transport theories of the lead
loss in the electrolysis of molten $PbCl_2$." The conference also decided to

establish a section on "transport theory in metallurgy." The second conference on this subject is scheduled to be held at our institute in 1984. [Text] [Shenyang DONGBEI GONGXUEYUAN XUEBAO [JOURNAL OF NORTHEAST INSTITUTE OF TECHNOLOGY] in Chinese No 2, 1982 p 118] 9899

MICROCOMPUTER TECHNOLOGY IN METALLURGICAL SYSTEMS--A conference on microcomputer technology in metallurgical systems was held in Kunming 16-20 April 1982. The faculties of our institute presented six papers and exchanged five papers. Two papers are included in the conference proceedings: "Microcomputers for the processing of spectroscopic data" by instructor Yan Boqian of the Servo-Systems Department, and "Control systems for general documents" by Du Haiquan. [Text] [Shenyang DONGBEI GONGXUEYUAN XUEBAO [JOURNAL OF NORTHEAST INSTITUTE OF TECHNOLOGY] in Chinese No 2, 1982 p 118] 9899

ELECTROMECHANICAL ENGINEERING CONFERENCE--The first national electromechanical engineering conference on variable analysis and optimal design met in Hongchow 17-20 April 1982. Four papers were presented by our faculties: "Optimal design for the casting of crane cylinders" by Assistant Professor Zhou Peide, "Variable analysis by repetition" by Assistant Professor Li Yujuan, "Solutions of Difference Equations by Iteration" by Assistant Professor Wang Junshu, "Variable Mixing Methods for Elastic Contact Problems" by assistant Professor Hu Gar-Low. [Text] [Shenyang DONGBEI GONGXUEYUAN XUEBAO [JOURNAL OF NORTHEAST INSTITUTE OF TECHNOLOGY] in Chinese No 2, 1982 p 118] 9899

FLUID MECHANICS, HYDRODYNAMICS CONFERENCE--The first national conference on multiphase fluid mechanics, non-Newtonian fluid mechanics and physical chemistry of hydrodynamics met in Beijing 17-21 April 1982. Two papers were presented by the Mechanical Engineering faculty members of our institute: "Studies on the motions of particle groups in centrifugal ore separation machines" by Assistant Professor Tong Qingli and "Theoretical analysis of particle velocity variations in flotation processes" by instructor Di Qingliang. These papers were included in the conference proceedings. The conference decided to establish a new section on multiphase fluid mechanics. Assistant Professor Tong Qingli has been elected as the director of the section. [Text] [Shenyang DONGBEI GONGXUEYUAN XUEBAO [JOURNAL OF NORTHEAST INSTITUTE OF TECHNOLOGY] in Chinese No 2, 1982 p 118] 9899

MINE VENTILATION SYSTEMS--A conference on ventilation systems for mines and their operating experience was held at the Hu-Keng tungsten mine in Jiangxi Province 6-12 May 1982. From the Ore Exploration Department of our institute assistant Professors Wang Yingmin and Chen Rongce attended the conference and presented two summary reports: "Outline of the development of ventilation technology in metallurgical mines during the past 32 years" and "Aerodynamics in mines and ventilation systems." They also presented a research paper: "Studies on filtering technologies in mines." [Text] [Shenyang DONGBEI GONGXUEYUAN XUEBAO [JOURNAL OF NORTHEAST INSTITUTE OF TECHNOLOGY] in Chinese No 2, 1982 p 118] 9899

CSO: 4008/200

TAIWAN: MICROCOMPUTER CAPABLE OF PROCESSING CHINESE

OW031325 Taipei CNA in English 0944 GMT 3 Aug 82

[Text] Taipei, 3 Aug (CNA)--The first microcomputer which has the capability
to process Chinese (?data), Microprofessor II Chinese (MPF-II-C), is scheduled
to make its debut this August as another innovative microcomputer made by
Multitech Industrial Corp. Though it is the first Chinese home computer, it
is priced for less than U.S. $600.

The MPF-II-C is innovative because with a compact size (9.84 x 7.65 x 1.23
inches), using the Chinese character controller (CCC) which contains only
64k bytes of memory, the MPF-II-C can access 22,000 Chinese characters.

Considering the fact that only 4,800 Chinese characters are commonly used,
it is generally acknowledged that the MPF-II-C can process almost all Chinese
characters. What is special about the MPF-II-C is that it is multilingual,
because it can also process Roman characters.

Without the CC, this microcomputer is exactly the same as Microprofessor II
(MPF-II), a microcomputer (?compatible) to the Apple II personal computer in
basic interpreter.

Incorporated into the CCC are the "dragon Chinese alphabet coding system
(dragon coding)" and the "dragon Chinese character generating system (dragon
generating)," which are also used on the dragon Chinese terminal D75, which is
another Multitech product with innovative design. Using the dragon coding
system, every Chinese character can be decoded into 1 to 5 codes with each
Chinese character averaging 3.8 codes.

CSO: 4010/13

AUTHOR: ZHOU Wenzhong [0719 2429 1813]
          HU Zhicai [5170 1807 2088]

ORG: Both of the Beijing Institute of Control Engineering

TITLE: "An Attitude Determination Method of Spin-stabilized Geostationary Satellite"

TEXT OF ENGLISH ABSTRACT: In this paper a method is presented in which the rotation angle from sun-earth midscan λ_{se}, in addition to the earth angle θ_e and sun angle θ_s, is simultaneously used for determining spin-stabilized geostationary satellite attitude.

This method uniquely gives one unambiguous attitude solution, simplifies the algorithm, eliminates regions of high correlation and low measurement density occurring when using two attitude measurements and provides geometric conditions where singularity occurs only if the earth and sun vectors are colinear. By this method the angle λ_{se} in conveniently incorporated into the kalman or least square filter.

Digital simulation showed that better accuracy of attitude determination and filter estimation can be obtained by this method.

9717
CSO: 4009/375

AUTHOR: None

ORG: Reporter of the Journal

TITLE: "Symposium on BOF Process"

ABSTRACT: The National Symposium on BOF Process, jointly sponsored by the Chinese Metals Society and the Iron and Steel Company of the Ministry of Metallurgical Industry was held on 6-12 Mar 82 in Liuzhou Iron and Steel Mill. Participants included 168 delegates representing 91 iron and steel enterprises, local medium and small iron and steel mills, scientific research and designing institutes, schools of higher education, intermediate specialty schools, and management departments. The results of research on oxygen top-blown convertor process and its production experiences in China were summarized and exchanged. Ways of carrying out further refinement, improving techniques and equipment, promoting scientific work procedures, and raising the economic benefits were discussed. The symposium was divided into 3 parts: The first part was devoted to scientific exchanges; 36 production and research reports were read and 50 additional papers were received. The second part was devoted to discussion and revising the basic work procedure of the oxygen top-blown convertor process, with the major goal of improving the quality, reducing waste, and adding more types of products. The third part was devoted to introducing the current production condition, major problems, and future direction of research.

AUTHOR: None

ORG: Metallurgical Slag Comprehensive Utilization Specialty Group

TITLE: "Technical Exchanging Meeting on the Use of Electric Furnace Slag"

ABSTRACT: The National Electric Furnace Slag Utilization Technology Exchange Meeting, jointly sponsored by the Metallurgical Slag Comprehensive Utilization Specialty Group of the Metallurgy Environment Protection Committee of the Chinese Metals Society, Chinese Environmental Science Society, and the Solid Waste Pollution Control and Comprehensive Utilization Group of the Environmental Engineering Society was held 23-27 Dec 81 at Laiwu Steel Mill and Yanzhou Construction Plant. Participants included 90 delegates representing 57 organizations of metallurgy, machinery, railway, construction materials, geology, national defense, and universities, colleges, and specialty schools. The major contents of discussions at the meeting include the following: (1) The condition of research, production, and application of white cement made from electric furnace reduction slag was introduced. (2) At present, the water quenching process is used for steel slag granulation treatment; delegates agreed that the technique should be gradually extended. (3) The capacity of China's electric furnaces is small, its distribution extensive, and the production conditions of all the mills are very different; therefore, different ways must be adopted to utilize the slag as construction material, road paving material, etc. to resolve the problem of pollution and reduce the production cost.
6168
CSO: 4009/379

AUTHOR: PU Qing [3184 3237]

ORG: None

TITLE: "Second Annual Conference of Shanghai Municipal Bonding and Joining Technology Association Held"

SOURCE: Shanghai JIXIE ZHIZAO [MACHINERY] in Chinese No 7, 20 Jul 82 pp 17, 42

ABSTRACT: The Shanghai Municipal Bonding and Joining Technology Association held its second annual conference on 24-26 May 82. A total of 370 persons attended, representing departments of chemical engineering, bonding and joining associations of other cities, related organizations, and bureaus of various industries of Shanghai. The conference first reviewed the condition of research, manufacture, and utilization of adhesives. It was pointed out that an adhesive is a refined chemical product and its application has become a new boundary science, which will have an important function in the national economy. The conference received and exchanged 45 papers which contributed new techniques and work procedures to the application of bonding and joining technology. Experiences in sealing machine tools, stabilizing structural members of machines, substitutes of riveting or soldering, and repairing worn and broken parts were exchanged and discussed.

AUTHOR: None

ORG: None

TITLE: "The M 50100 Single Arm Slideway Grinder, Produced by Shanghai Heavy Machine Tool Plant"

SOURCE: Shanghai JIXIE ZHIZAO [MACHINERY] in Chinese No 7, 20 Jul 82 front cover, p 40

ABSTRACT: A photo of the M 50100 single arm slideway grinder is used as the front cover of this issue of the journal. The grinder is equipped with 3 grinding heads, has hydraulic drive, thin film feedback, and static pressure lubrication. Its property is reliable and precision stable. The major technical parameters of the grinder are described and explained on p 40. The adresses of the manufacturer, its business office, and telephone numbers are given, as well as other products made by the manufacturer.

6248
CSO: 4009/378

AUTHOR: HE Jiankun [0149 1696 0981]
            WU Zongxin [0702 1350 9515]
            LU Yingzhong [0712 2019 0022]

ORG: All of the Institute of Nuclear Energy Technique, Qinghua University

TITLE: "The Optimal Programming for a Nuclear Power System"

TEXT OF ENGLISH ABSTRACT: A nuclear power system is very vast and complex. The
entire national nuclear power system may consist of several types of reactors.
These types of reactors make up a symbiotic fuel cycle system. The technology
of thermal converters has matured and its power generation cost is cheaper. How-
ever, its uranium utilization is lower. Although the gain of nuclear fuel for FBR
is very fast, a larger inventory of fissible fuel and more capital are needed, and
the inventory during the initial stage of FBR development must be supplied by the
thermal converters. Therefore, there exists an optimal mix of thermal converters
and FBR, which can achieve better economic effects in this system. In addition,
the economic scale of nuclear industry enterprises is very large now. It is
necessary to consider the appropriate introduction schedule of these enterprises.

This paper describes the dynamic linear programming model developed for a nuclear
power system. Based on the physical essence of each process in this system and
nuclear fuel flows, the various equilibrium equations and restraint relationships
of variables are set up. These mathematics models describe the whole physical
process of the nuclear fuel cycle. Both linear programming and mixed integer
programming are used to solve these problems. The primary results have well
represented the dynamic characteristics of the whole system and given out the
activity level of each process, the flow rate of nuclear fuel between processes
and the number of economic scale enterprises in each time period under optimization
conditions. The dynamic linear programming model is an efficient approach for
the nuclear power system project.

AUTHOR: None

ORG: HWRR Laboratory, Institute of Atomic Energy, Chinese Academy of Sciences

TITLE: "Reconstruction of HWRR and Its Primary Cooling Circuit"

TEXT OF ENGLISH ABSTRACT: This paper describes the implementation of reconstruction work of HWRR, the first research reactor operated in China.

After 20 years of operation, the core tank was replaced by a new one with some modification of the core arrangement. The primary cooling system was also modified and overhauled in order to upgrade the cooling capacity and reactor power level. The old core tank was integrally buried in a pit under the reactor hall. Measures were taken to decrease radiation hazard. The collective radiation dose of the whole project, which stretched for a period of 22 months, is 168 man-rem. High quality was assured. All design targets were achieved, and the HWRR was successfully put into on-power operation in October 1980.

AUTHOR: HONG Jingfeng [3163 2529 6265]
          ZHAO Shoujun [5392 1343 6874]
          JIANG Zilong [5592 5261 7893]
          et al.

ORG: All of the Southwest Institute of Nuclear Reactor Engineering

TITLE: "The Analysis and Experimental Study of Impact of the Tube Against Supporting Baffles in Heat Exchanger"

TEXT OF ENGLISH ABSTRACT: In nuclear reactor engineering, the vibration of the fuel element rod and tube of the heat exchanger is frequently induced by coolant flow. They always strike the intermediate supporting baffles during vibration. This kind of impact is intermittent and repeated. As a result, the wear and fretting of the tube will be created, causing damage. Therefore, it is very important to study the dynamic effect of this impact. In recent years an investigation of this problem has been conducted by the authors.

The dynamic effects of impact of a tube with fixed ends against multi-intermediate supports have been studied experimentally and analytically in this paper. The tested model is a stainless steel tube of 13.20 mm O.D., 10.20 mm I.D. and 1436 mm in length. Its ends are clamped. The baffles are simulated with support plates.

Their number is up to three and their positions are adjustable. The rigidities of the support plates are different. The clearances between the tube and plates are in the range from 0.20 mm to 1.00 mm. The duration and number of times of impact and time-history of response of the tube motion are recorded.

The test results show that the tube dominantly vibrates in the form of a beam with a single span, but the fundamental frequency is higher than its first natural frequency. The curve of the ratio of fundamental frequency of response to first natural frequency of beam vs the ratio of initial displacement to clearance is given. Also the curve of the duration for contact with support vs initial displacement-clearance ratio is obtained. The calculation is made by the theory of beam vibration. The analytical and experimental results are in good agreement. Many components of higher frequency are introduced into the response of motion. Their frequencies depend upon the position of support and their magnitudes are relative to intensity of impact. The linear spectrum of frequency for the motion response is given by Fourier Analysis.

AUTHOR: SUO Changan [4792 7022 1344]

ORG: Institute of Atomic Energy, Chinese Academy of Sciences

TITLE: "Interconversions of Critical Size in Reactors with Irregular Arrangement of Control Rods (II)"

TEXT OF ENGLISH ABSTRACT: By using the principle of "imaginary reactor," the conversion of critical size which relates many control rods within the rectangular reactor to one single control rod has been derived. In addition, the interconversion which related the rectangular to the cylindrical reactor has also been done. The theoretical results agree well with the experimental ones.

AUTHOR: FU Longzhou [0265 7893 5297]

ORG: Xi'an Jiaotong University

TITLE: "Optimal Linear System with Prescribed Degree of Damping or of Stability"

TEXT OF ENGLISH ABSTRACT: This paper studies the optimization of linear systems, including the linear nuclear reactor system, with the "modified frequency method."

In general, when the quadratic performance index is used, the optimization of the system requires that the value of the performance index J be a minimum. In practice, the minimal value of J does not mean that the index of the quality of the transient response is satisfactory.

In this paper when the problem of optimization of linear systems is studied by the modified frequency response method, not only can the minimal value of the quadratic performance index be obtained, but also the transient response can be obtained simultaneously with the prescribed degree of stability or degree of damping. This method, when used in conjunction with the Kalman equation, appears extremely convenient and useful.

AUTHOR: YANG Yaochen [2799 5069 5256]

ORG: Institute of Plasma Physics, Chinese Academy of Sciences, Hefei

TITLE: "Effect of the First Wall Thickness and Its Impurity to the Yield for Uranium-Plutonium Cycle Fusion-Fission Hybrid"

TEXT OF ENGLISH ABSTRACT: The characteristic parameters expressing the hybrid performance are defined. The basic configuration and results of neutronic calculation for the hybrid are presented. The effects of various first wall thickness to the yield of the hybrid are calculated, and the effects of the impurity contained in the first wall material to the yield of the hybrid are analyzed. It is shown that the effect of the first wall thickness to the yield of the hybrid is serious, but the purity of the first wall of the hybrid is unimportant. As for the important structural material, the first wall, the research focal point should lie in obtaining high strength and high antiradiation capacity for decreasing the first wall thickness; in addition, the purity of the alloy is not overcritical.

AUTHOR: PEI Lucheng [5952 7773 2052]

ORG: Institute of Atomic Energy, Chinese Academy of Sciences

TITLE: "Study of Random Sampling Methods for Scattering Directions"

TEXT OF ENGLISH ABSTRACT: The random sampling of the scattering direction is not only quite common but also very important in Monte Carlo calculations of particle transport problems. In this paper, several new random sampling methods that avoid the calculation of trigonometric and all other complicated functions are developed. The distributions considered here include those of general scattering angle, isotropic scattering angle in the laboratory system, isotropic scattering angle in the center-of-mass system, and uniformly distributed scattering azimuthal angle. The efficiency of these new random sampling methods is high in comparison with the best of the existing methods.

AUTHOR: MENG Xiangti [1322 4382 2251]
          DU Guangting [2629 0342 1656]
          LIU Kaimin [0491 7030 2404]

ORG: All of the Institute of Nuclear Energy Technique, Qinghua University

TITLE: "Electrical Properties and Radiation Defect Annealing Behavior of NTD Silicon Grown by Floating Zone Method in Hydrogen Atmosphere"

TEXT OF ENGLISH ABSTRACT: Electrical properties and radiation defect annealing behavior of NTD Si grown by the floating zone method in hydrogen atmosphere were studied by Hall coefficient-resistivity measurements, minority carrier lifetime measurements and deep level transient spectroscopy (DLTS). The neutron doping was performed at temperatures of ~30°C and ~200°C separately in our swimming pool-type research reactor, with the Cd-ratio of ~10. The concentration of transmuted ^{31}p is ~6 x 10^{13} atoms cm^{-3}. One hour isochronal annealing from 400°C to 1200°C was carried out in a quartz-tube furnace with high pure nitrogen atmosphere. In this paper the isochronal annealing results of free carrier concentration, mobility and DLTS measurements were given and the energy level, capture section and concentration of the remaining deep level defects were calculated. Preliminary experimental results indicate that because of the existence of hydrogen, this NTD Si exhibits

some obvious characteristics. For example, the temperature of P→N type transformation and recovery temperature of carrier concentration and mobility is lower than those of the samples grown in an argon atmosphere. After annealing at ~450°C, an excess donor concentration and a high concentration of DLTS defects have been observed. At higher doping temperature the concentrations of the above-mentioned donor and DLTS defects are higher, and the mobility and minority carrier lifetime are lower than those at lower temperatures. The isochronal annealing curves of free carrier concentration and mobility have a greater waving when the annealing temperature is lower than 850°C. The results also indicate that annealing behavior of deep level defects is in good agreement with the changes of lifetime and carrier mobility. It is pointed out that after annealing for one hour at 800~850°C, the radiation defects in this NTD Si can be removed and electrical properties can be recovered. The experimental results are discussed briefly.

AUTHOR: SUN Xueyu [1327 7185 3842]
          HU Ransheng [5170 3544 3932]
          LI Zhenyuan [2621 2182 0337]

ORG: All of the Beijing Comprehensive Instrument Factory

TITLE: "Palladium-Silicon Surface Barrier Nuclear Radiation Detectors with Wide Sensitive Region"

TEXT OF ENGLISH ABSTRACT: The palladium-silicon surface barrier detectors made from N-type high resistivity silicon in which the width of sensitive region reaches 0.5-3 mm are presented. They possess features such as thin window, wide sensitive region, high bais voltage, low leakage current, high energy resolution, good stability, etc. The energy resolutions are 0.45 percent (20 mm^2 sensitive area, 1.5 mm thickness, ^{241}Am source, at room temperature, in vacuum), 1.7 percent (976 keV internal conversion electron of ^{207}Bi), and 0.98 percent (300 mm^2 area, 2 mm thickness, 976 keV internal conversion electron of ^{207}Bi, at -40°C).

9717
CSO: 4009/373

AUTHOR: ZHU Shiyao [2612 6108 I031]

ORG: Department of Physics, Shanxi University, Taiyuan

TITLE: "The Quantum Theory of the Two-mode Laser in a Three-level Atomic System with Common Low Level"

TEXT OF ENGLISH ABSTRACT: The quantum theory of two-level atom single-mode laser system of Sargent, Scully and Lamb is extended to a two-mode laser in a three-level atomic system with common lower level, and a master equation is obtained for the system with all three levels being pumped. Four terms appear in the master equation that are absent in the single-mode case and those interpreted as two-photon processes play a special role in the present case. The master equation is represented by a probability flow diagram in two dimensions with the photon numbers n_1 and n_2 of the two-mode laser as variables. The probability flow diagram can be extended to infinity, and each arrow represents a term of the right hand side of the master equation. By taking the sum over one of the variables n_1 or n_2, the master equation is reduced to two equations, each of them being represented by a one-dimensional probability flow diagram. The equation of motion under steady state is obtained by considering the correspondence between the macroscopic balance and the microscopic balance.

A parameter H is introduced to reduce the equation of motion and to facilitate the mathematical procedure and a formal solution is thus obtained. Using the equation of motion and its formal solution various operation characteristics are discussed. Among them are: the threshold condition for each mode; the condition of only one mode operation; the variation of photon statistics between single-mode operation and two-mode operation and the variation of photon statistics with the lower level both being pumped and not pumped.

AUTHOR: WANG Qi [3769 3823]

ORG: Shenyang Institute of Computing Technology, Chinese Academy of Sciences

TITLE: "A More Accurate Algorithm of the OTF"

TEXT OF ENGLISH ABSTRACT: Starting from the Kirchhoff diffraction integral formulation, the complex amplitude distribution in the image of a point object is given with an approximation of excelling the Fresnel diffraction field. The new formula is derived by means of the wavefront surface generating the diffraction to the image plane and not introducing the reference sphere. The changing part δ of the distance $\hbar$ is expanded, as is $(1+\cos\alpha)/\hbar$. The slant of the wavefront surface toward the image plane is also investigated. The wave aberration W is defined by a new form, convenient for computation of the formula. In order for the amplitude distribution to become an obvious model, the new variables $\tilde{y}$ and $\tilde{z}$ are quoted. There is the relation between them and the exit pupil coordinates y and z. Therefore, the amplitude distribution in the image of a point object is obtained by adding the three Fourier transforms, and then the OTF is given. The new algorithm is generalized for previous articles. In the numerical method, it is mainly explained by computing the wave aberration function $W(\tilde{y}, \tilde{z})$ and the functions $\tilde{\Psi}_0$,

$\tilde{\Psi}_1$ and $\tilde{\Psi}_2$ through linear interpolation in the range of the two dimensions. Finally, this paper shows that deriving the new algorithm needs only the condition that is weaker than the Fresnel condition and also weaker than the far field condition.

AUTHOR: WANG Runwen [3769 3387 2429]

ORG: Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of
Sciences

TITLE: "Three-dimension Stress Analysis"

TEXT OF ENGLISH ABSTRACT: Three-dimensional stress analysis is usually using the
method of frozen stress and the method of light scattering. Aben proposed varying
the polarization state or the wavelength of incident light in 1970. Then he could
resolve the plane stress of each slab. However, we do not have a satisfactory
theory to obtain a method of measurement and analysis of three-dimensional
principal stress. In this paper we expand Aben's method and use it for the loaded
plate model. Varying the wavelength of the incident light and measuring the
polarization character along each axis x, y, and z in combination with inter-
ferometric photoelasticity produces a frozen stress medium. Then, using the
analysis presented in this paper, we can provide information for the magnitude and
direction of three principal stresses.

AUTHOR: YING Xuantong [2019 5503 0681]
          XIA Shaofeng [1115 4801 6265]
          JIA Yurun [6328 3768 3387]
          ZHANG Zhiming [4545 1807 7686]

ORG: All of the Department of Physics, Fudan University, Shanghai

TITLE: "Laser Scanner for Computer-generated Holograms"

TEXT OF ENGLISH ABSTRACT: Computer-generated holograms for optical spatial filter-
ing drawn by a laser scanner have several advantages, i.e., they can be obtained
directly with the proper size without further reduction photography, and the pixels
of the hologram have gray scales. We have designed and constructed such a system
that includes some modifications to meet the requirements of using simple and
inexpensive optics as well as obtainable electronics. A field lens is adapted to
keep the scanning beams almost fixed during their entry into the camera lens and
hence it is unable to use a camera lens of f-number down to less than f/1:2. The
reduction ratio of the dimensions of the input aperture to the final pixel is
chosen to be 1:32, and the galvanometer-driven scanning mirror could cover the
first sidelobes of the diffraction pattern of the input aperture. The system is
driven by a compact CMOS electronics which is assembled in our laboratory, and used

to control the scanning mirror and the acousto-optic shutter synchronously. The present setup has the following capabilities: (1) gray scale: 127; (2) spatial resolution: 10μ x 20μ; (3) size of the hologram in mm^2: 10.2 x 10.2; (4) space-bandwidth product: 1024 x 512; (5) time needed in minutes: 17. We have also fabricated several spatial filters for optical processing by using this system and the performances of such filters are presented.

AUTHOR: REN Bingfu [0117 4426 1788]
          JIN Feng [6855 1496]
          XU Mai [1776 6701]

ORG: All of the Changchun Institute of Physics, Chinese Academy of Sciences

TEXT OF ENGLISH ABSTRACT: The K_9 glass substrate made in China was dipped in silver melts at 270~300°C, the Ag^+-Na^+ ion exchange was made under constant temperature conditions, and the planar optical waveguides of graded index profile have been fabricated. Mode indices of these waveguide samples have been measured with a symmetric prism coupler at 6328 A laser wavelength.

In this paper, White and Heidrich's calculational formulas determining the waveguide index profile by mode indices have been reduced, and simple new methods determining the waveguide surface index by mode indices have been presented. On this basis, it is determined by mode index measurement values that the refractive index profile of K_9 glass waveguides formed by ion exchange is

$$n(x) = -(n_s - n_b)[(x/d) + \alpha(x/d)^2],$$

where n_s = 1.5930 and n_b = 1.5146 are refractive indices of the waveguide surface and substrate respectively, α = 0.66 is the second-order term coefficient, d is the effective diffusion depth and x is the distance from waveguide surface.

For the second-order polynomial profile of optical waveguide index the mode equation and cut-off equation have been derived, from which the mode dispersion and cut-off properties have been analyzed and technical fabrication conditions of single-mode and multi-mode waveguides have been given.

Analytical results show that theoretical calculations are identical with experimental measurements. This paper provides necessary basic information for fabrication of single-mode and multi-mode waveguide devices required by optical fiber communication systems with K_9 glass waveguides formed by ion exchange.

AUTHOR: WU Minda [0702 2404 6671]
          NI Shuhuai [0242 2885 2849]

ORG: Both of the Department of Optical Instruments, Zhejiang University,
Hangzhou

TEXT OF ENGLISH ABSTRACT: This paper presents an optical method for measuring the flutter of plane model with dynamic shadow Moire topography. There are some advantages of this method in comparison with the electric method by using the acceleration sensor, such as getting all information of the measured surface instead of that from only several points, simplified testing process and, in particular, the information is recorded on film for reconstruction.

In this paper, the function of intensity distribution of Moire topography using the principle of light intensity and Fourier series expansion under any arrangement, and the formulas of the depth of Moire topography are derived. The errors of the formulas are analyzed. In order to satisfy the accuracy requirement, the error of grating pitch must be less than 0.02 mm.

This paper also describes the principles and dimensions of an arrangement device in the test which, combined with shadow Moire topography and ZL1 high-speed camera, was used to measure the first and second order vibrations of the plane model. Data analysis of the maximum amplitude of 15 coordinate points, drawing of the "position-amplitude" curves for first and second order vibrations, as well as "time-amplitude" curves for second order vibration were made. We have compared the results of this method in accuracy with the electric method by using the acceleration sensor. The deviation of amplitude is less than ±0.03 along the spanwise center-line for first order vibration, and less than ±0.065 mm along the chordwise center-line for second order vibration on the measured surface of the plane model.

The results of the experiments show that this optical method can be used for measuring the flutter of the plane model, and its accuracy is quite satisfactory.

AUTHOR: QI Yu [7871 6877]

ORG: Changchun Institute of Optics and Fine Mechanics, Chinese Academy of Sciences

TEXT OF ENGLISH ABSTRACT: According to the American color standard ANSI, the color restoration of photographic lenses is discussed in this paper.

The effect of light absorption of lens glasses on the color balance is pointed out and the function of antireflection coating to the improvement of color restoration characteristics of lenses is analyzed in detail. The color contribution of various kinds of antireflection coating is also calculated. The design, calculation and results of antireflection coatings for a 10x zoom lens are given. The results show that if the antireflection coatings are chosen reasonably, the transmittance and color restoration characteristics of lenses can both be greatly improved.

AUTHOR: YU Wenyan [1776 2429 3508]
          WANG Guiying [3769 2710 5391]

ORG: Both of the Shanghai Institute of Optics and Fine Mechanics, Chinese
Academy of Sciences

TITLE: "A Holographic Diagnosis of Laser Beams"

TEXT OF ENGLISH ABSTRACT: This paper reports a holographic interference method
for measuring the wavefront of a laser beam. A telescope is placed in an arm of
the ring interferometer, so an expanded laser beam and a reduced laser beam are
produced. These two beams should interfere and form a coaxial hologram. The
curvature radius of the laser beam is obtained by measuring the localization of
the reconstructed image. The measurement precision of the wavefront curvature
radius corresponds to the depth of focus, three times higher than common inter-
ferometer. In addition, the pattern is direct, visual and spatially resolvable.

AUTHOR: XU Jialong [6079 1367 7127]

ORG: Xi'an Institute of Optics and Fine Mechanics, Chinese Academy of
Sciences

TITLE: "Inquiry into the Design of Rotating Mirror House of the Streak Camera"

TEXT OF ENGLISH ABSTRACT: The mirror house design at home and abroad has been
reviewed simply in this paper. A new consideration for the design of the house
is proposed, and analysis of the chief characters and application vista are given.

According to the optical principle of the streak camera, the coordinate equations
of the image point have been derived before and after the plate glass is added.
After the plate glass is added, the writing rate of the image on the film track
is given.

The calculation indicates: the larger relative aperture of the instrument, the
thinner plate glass is allowed, the more rigorous the requirement of axial displace-
ment. When the mirror rotates, the Δ-curve of the axial image points for different
relative apertures is shown.

Using the actual instrument, the performances of the instrument using a spherical cover or plate glass are compared. The defocusing of $\partial S'$ is critical data for the streak camera since it will directly affect the imaging quality of the instrument.

AUTHOR: LU Xiaojing [9310 1420 7231]
           ZHAO Shuqing [6392 3219 3237]

ORG: Both of the Changchun Institute of Optics and Fine Mechanics, Chinese
Academy of Sciences

TITLE: "Extraction of Directional Construction from Photograph by Optical
Filtering"

TEXT OF ENGLISH ABSTRACT: The directional characteristic of some objects is
analyzed by means of $2D$ Fourier series. The Fourier coefficients have been
numerically calculated for the typical objects, and by using optical filtering
the objects are extracted from pictures. Then, optical directional filtering
for the satellite-photograph is performed. Experimental results are given.

AUTHOR: JIANG Yasi [5592 0068 4828]
          JIANG Fusong [1203 1788 2646]
          GAN Fuxi [1626 4395 3588]

ORG: All of the Shanghai Institute of Optics and Fine Mechanics, Chinese
Academy of Sciences

TEXT OF ENGLISH ABSTRACT: Fluorophosphate glass is used as a kind of optical
glass and laser material.   Based on studying the formation and structure of
Al(PO$_3$)$_3$ contained in fluorophosphate glass, in the present work the optical and
other physical properties of the glass have been investigated.   The low Al(PO$_3$)$_3$
content fluorophosphate glass, in which the network structure has been seriously
destroyed, is located in the destroyed region, while the variation of the glass
properties and the effect of various fluorides on the properties are similar to
those of the oxide glass in the destroyed region.   The special role of LiF, MgF$_2$
and AlF$_3$ is also reflected in the variation of the physical properties.   Moreover,
compared with silicate and borate glasses with high contents of the former glasses,

[Continuation of GUANGXUE XUEBAO No 4, 1982 pp 372-379]

the electrostatic attraction between cations and anions plays a more important role
in the variation of the properties of the fluorophosphate glass with low Al(PO$_3$)$_3$
content.   The position of the studied glass in n vs ν diagram is plotted, the partial
properties of the studied glass are given and compared with some data in the liter-
ature, and the variation of the partial properties is related to the Al(PO$_3$)$_3$
content.

AUTHOR: HUANG Guosong [7806 0948 2646]
          CHEN Shizheng [7115 0013 2973]

ORG: Both of the Shanghai Institute of Optics and Fine Mechanics, Chinese
Academy of Sciences

TITLE: "Thermo-optic Properties of Optical Glass"

TEXT OF ENGLISH ABSTRACT: In order to minimize the influence of the environmental
temperature on optical components, thermo-optics coefficients W, P and Q that
describe the variation of optical properties of optical glasses at a certain
temperature are introduced. The methods of measuring some optical glasses in
respect of their coefficients are described and the results are given. This
paper ends with a discussion of the possibility of reducing the influence of
thermal disturbance on optical components.

9717
CSO: 4009/372

AUTHOR: SI Wei [1835 4850]

ORG: None

TITLE: "The Fourth Conference of Central South Five Provinces (Regions) Printing Technology Cooperative Group Held in Guangzhou"

SOURCE: Beijing YINSHUA JISHU [PRINTING TECHNOLOGY] in Chinese No 4, 1982 p 3

ABSTRACT: The Fourth Conference of the Central South Five Pronvinces (Regions) Printing Technology Cooperative Group and the Graphic Plate-making and Printing Experience Exchange Meeting were held jointly in Guangzhou on 5-11 May; 69 delegates representing 44 bureaus of publications, related departments, and printing plants attended. The delegates agreed that as all of this year's projects of the cooperative group have been completed rather satisfactorily, the future goals of the group should be to strengthen staff training, to extend new techniques, to strengthen industrial management, to improve the quality of products, and to shorten the publication cycle. There should be more exchanges of experience on specific techniques. Many forms should be adopted to extend the advanced experience of local plants. The conference assigned 7 items of exchange for 1982 and the provinces (regions) to be responsible for the respective item. The Fifth Cooperative Group Annual Conference will be held in Zhengzhou in Apr 1983.

6168
CSO: 4009/381

AUTHOR: None

ORG: Conference for the Establishment of a National Printing Industry Science and Technology Information Network

TITLE: "National Printing Industry Science and Technology Information Network Conference"

SOURCE: Beijing YINSHUA JISHU [PRINTING TECHNOLOGY] in Chinese No 4, 1982 pp 2-3

ABSTRACT: The National Printing Industry Science and Technology Information Network Conference, sponsored by the National Bureau of Publications, was held in Kunming City of Yunnan Province on 21-26 May 82. Participants included 57 delegates representing the bureaus of publication of the 28 provinces, cities, and autonomous regions, the 13 research institutes of printing technology, the China Printing Company, the China Printing Material Company, the China Printing Technology Association, Beijing College of Printing, and Shanghai School of Printing. This was the first national conference concerning the work of information of printing technology. The National Printing Industry Science and Technology Information Network Charter (Draft) was discussed, revised, and finally unanimously approved by the delegates. The first group of information stations are to be established at the China Research Institute of Printing Science and Technology, and the Research Institutes of Printing Technology of 12 provinces. The Information Network was officially declared as having been established. The network will, in forms of journals and express reports, disseminate information materials, research reports, etc. to the various informa-

[continuation of YINSHUA JISHU No 4, 1982 pp 2-3]

tion stations. It was agreed that the Central Station, which is the China Research Institute of Printing Science and Technology, and the information stations of Liaoning and Shaanxi will be responsible to organize an editorial committee of the network journal. The establishment of a technical consulting service was also discussed. The delegates agreed that at present the task of strategic importance is to train and organize a group cadres with skills of gathering and disseminating scientific and technological information.

END